IN THE CLAIMS:

1. (CURRENTLY AMENDED) A method of processing a workpiece in a vacuum plasma processor chamber wherein a gas species is converted into an AC plasma, the vacuum chamber being subject to operating at different pressures while the workpiece is being processed, the gas species being subject to flowing into the chamber at different flow rates while the workpiece is being processed, comprising, gradually changing on a pre-programmed basis, the amount of AC power supplied to the plasma during processing of the workpiece while the power is in a steady state condition subsequent to power start up and prior to the beginning of power shut down.

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2. (CURRENTLY AMENDED) The method of claim ~~1~~ 7 wherein the gradual power change occurs while no change is made in (a) the species, (b) the pressure or (c) the flow rate.

3. (CURRENTLY AMENDED) The method of claim ~~1~~ 7 wherein the AC power is supplied by an electrode coupling an AC electric field to plasma in the chamber.

4. (ORIGINAL) The method of claim 3 wherein the electrode is responsive to an AC power source that supplies RF bias voltage to the electrode, the electrode being on a holder for the workpiece.

5. (ORIGINAL) The method of claim 3 wherein the electrode is responsive to an AC power source that supplies RF plasma excitation voltage to the electrode, the electrode responding to the RF voltage to supply RF electric field to the plasma to excite the gas to the plasma.

6. (ORIGINAL) The method of claim 3 wherein the AC power is supplied by a coil coupling an RF plasma excitation electromagnetic field to the chamber.

7. (CURRENTLY AMENDED) The method of claim 1 wherein a gradual transition in the shape of material in the workpiece being processed occurs in response to the gradual power change, the gradual power change occurring during the gradual transition in the shape of the material.

8. (ORIGINAL) The method of claim 7 wherein the species is ionized into a plasma that etches the material, the gradual power change and the species being such that the material is shaped to have a rounded corner in response to changes in the ionized plasma etchant resulting from the gradual power change.

9. (ORIGINAL) The method of claim 8 wherein the etching, which occurs in response to changes in the ionized plasma etchant resulting from the gradual power change, forms a trench wall including the rounded corner.

10. (ORIGINAL) The method of claim 9 wherein the rounded corner is at an intersection of a wall and a base of a trench.

11. (ORIGINAL) The method of claim 7 wherein the rounded corner is at an intersection of a wall and a surface intersecting the wall, the surface extending generally at right angles to the wall.

12. (CURRENTLY AMENDED) The method of claim ~~1~~ 7 wherein the gradual change includes steps having power changes no greater than about several watts, the power remaining at a constant wattage for no more than about 1 second.

13. (ORIGINAL) The method of claim 12 wherein the power steps are a few milliwatts and remain at a constant power for about 1 millisecond.

14. (CURRENTLY AMENDED) A vacuum plasma processor for processing a workpiece in a vacuum plasma processor chamber wherein a gas species is converted into an AC plasma comprising a reactive element for supplying an electric field to plasma in the chamber, and an electric source for supplying gradually changing amounts of ~~plasma~~ power on a preprogrammed basis to the reactive element while the power is in a steady state condition subsequent to power start up and prior to the beginning of power shut down.

15. (CURRENTLY AMENDED) The processor of claim 14 further including a controller for causing the source to supply the gradually changing amounts of power on the preprogrammed basis to the reactive element while a single workpiece is being processed and for causing a gradual transition in the shape of material in the workpiece being processed in response to the gradual power change, the processor being arranged to cause the gradual power change to occur during the gradual transition in the shape of the material.

16. (ORIGINAL) The processor of claim 15 wherein the controller is arranged for (a) controlling (i) a gas species adapted to flow into the chamber, (ii) the pressure in the vacuum chamber, and (iii) the flow rates of the gas species, and (b) maintaining the constant (I) the gas species, (ii) the gas species flow rate and (iii) the chamber pressure while the plasma power is gradually changing on the preprogrammed basis.

17. (CURRENTLY AMENDED) A memory storing a computer program for controlling a computer for controlling processing of a workpiece in a vacuum plasma processor chamber wherein a gas species is converted into an AC plasma, the chamber being capable of operating at different pressures while the workpiece is being processed, the gas species being subject to flowing into the chamber at different flow rates while the workpiece is being processed, the computer program storing a signal causing the amount of AC power applied to the plasma while the workpiece is being processed; the stored signal for the amount of applied AC power causing gradual preprogrammed changes in the amount of AC power supplied to the plasma during processing of the workpiece while the power is in a steady state condition subsequent to power start up and prior to the beginning of power shut down.

18. (CURRENTLY AMENDED) The ~~program~~ memory of claim ~~17~~ 19 wherein the computer program also stores signals causing (a) the vacuum chamber to operate at different pressures while the workpiece is being processed and (b) control of the gas species type and the flow rates thereof into the chamber while the workpiece is being processed, the stored signals causing the gradual power change to occur while no change is made in (a) the species, (b) the pressure or (c) the flow rate.

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19. (CURRENTLY AMENDED) The ~~program~~ memory of claim 17 wherein the stored signal causing gradual power change causes a gradual transition in the shape of material in the workpiece being processed in response to the gradual power change to cause the gradual power change to occur during the gradual transition in the shape of the material.

20. (CURRENTLY AMENDED) The program of claim ~~18~~ 19 wherein the stored signals control etchant species supplied to the chamber while the workpiece is being processed and the gradual power transition so as to cause the workpiece to be etched to have a rounded corner.

21. (CURRENTLY AMENDED) The ~~program~~ memory of claim 20 wherein the stored signals control etchant species supplied to the chamber while the workpiece is being processed and the gradual power transition so as to cause the workpiece to be etched to have a trench wall including the rounded corner.

22. (CURRENTLY AMENDED) The ~~program~~ memory of claim 21 wherein the rounded corner is at an intersection of a wall and a base of a trench.

23. (CURRENTLY AMENDED) The method of claim ~~1~~ 7 wherein the gradual change is substantially continuous and gradual.

24. (PREVIOUSLY ADDED) The processor of claim 14 wherein the gradual change is substantially continuous and gradual.

25. (CURRENTLY AMENDED) The ~~memory~~ program of claim ~~17~~ 19 wherein the gradual change is substantially continuous and gradual.

26. (PREVIOUSLY ADDED) The method of claim 23 wherein the gradual change includes steps having power changes in the range of a few milliwatts to several watts and having dfurations in the range of about one millisecond to about one second.

27. (PREVIOUSLY ADDED) The processor of claim 24 wherein the gradual change includes steps having power changes in the range of a few milliwatts to several watts and having durations in the range of about one millisecond to about one second.

28. (CURRENTLY AMENDED) The ~~memory~~ program of claim ~~17~~ 19 wherein the gradual change includes steps having power changes in the range of a few milliwatts to several watts and having durations in the range of about one millisecond to about one second.

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29. (NEW) The processor of claim 19 wherein the controller is arranged for causing a gradual transition to occur in the shape of material in the workpiece being processed in response to the gradual power change and for causing the gradual power change to occur during the gradual transition in the shape of the material.